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# Seismic Activity and Hydraulic Fracturing

 [Christine Wozniak](#) September 12, 2014

Earlier this month, Oklahoma Governor Mary Fallon created a new entity – the Coordinating Council on Seismic Activity—to connect legislators with researchers exploring the relationship between seismicity and hydraulic fracturing. The month before, a resident of Prague – a small town about 60 miles due east of Oklahoma City – filed a complaint in state district court against Spess Oil and [New Dominion](#), seeking punitive damages for injuries due to [earthquakes](#) the plaintiff blamed on wastewater injection wells.

And that is only in Oklahoma.

We recently posted a blog entry from Haynes and Boone partner [Jeff Civins](#) on a regulation the Texas Railroad Commission proposed at the end of August to address potential connections between disposal wells and seismic activity. The proposal comes on the heels of the state legislature forming a seismic subcommittee, which was addressed at a recent hearing by a seismologist the commission hired earlier this year.

These sorts of moves have recently become par for the course in states known for their shale production but not for their historically high levels of seismicity. Oklahoma – far from any continental plate or famous fault lines – is now the [second most seismically active](#) state in the Lower 48, trailing only California.

In [outline form](#), the states are generally pursuing similar policies by attempting to gather better seismic data about disposal sites and by restricting disposal in areas with faults that waste injections could set off. But states being the [laboratories of democracy](#) that they are, there are certain variations. In honor of the Texas Railroad Commissions' proposal, we have quickly summarized activities elsewhere in the roundup below:

- Arkansas: In 2011, Arkansas' Oil and Gas Commission passed a [moratorium](#) on drilling new disposal wells within a 1,150 square mile radius area that had experienced an increase in tremors.
- California: Because of California's well-known vulnerability to earthquakes, concerns about seismicity have figured prominently into policy debates there over fracking. In 2013, the state legislature passed [Senate Bill 4](#), which created a new statutory framework for the production of the state's rich shale resources. The California Department of Conservation proposed implementing regulations in November and proposed a new version in June. The current draft of the regulations focuses not only on waste disposal but also on hydraulic fracturing. That is a crucial distinction, as the connection between waste disposal and seismicity is much more widely accepted among researchers, regulators, and the industry than any potential connection between well stimulation and seismicity is. The regulation would require producers to monitor seismic activity during and after well stimulation treatment, and it would call for enhanced evaluations if earthquakes with 2.0 or greater magnitudes are detected nearby.
- Colorado: In June, Colorado regulators [shut down](#) an oil and gas wastewater injection well located in the northern part of the state after linking it to nearby earthquakes. In July, the Oil and Gas Conservation Commission allowed the well to [resume](#) operations, but with certain limitations in place. Injections are to continue at lower pressures and lower volumes, and the basement of the well is to be plugged an additional 400 feet to increase the distance between the zone of injection and the basement rock- hopefully cutting off the preferred pathway for the injected wastewater that was possibly causing the seismic activity. The well operator must install a seismic activity monitor, and the Commission said that it will not hesitate to review and shut down operations again if a seismic event occurs within a 2.5 mile radius of the well, with a magnitude of 2.5 or above.
- Kansas: In January, the governor established a three-member [task force](#) to study seismicity in the state and prepare a state action plan. On September 1, the task force released a [draft plan](#) calling for enhanced seismic monitoring.
- Ohio: After a spate of small earthquakes in 2011 near an injection well near Youngstown, culminating in a 4.0 temblor on December 31st, 2011, new safety standards were put in place that [prohibit](#) disposal well operators from drilling all the way to the layer of crystalline basement rock, or into the layer of sandstone just above that basement layer until the state monitors the sandstone with seismometers. More recently, Ohio has decided to outright [forbid](#) wastewater injection wells near fault lines if certain red flags emerge. In April, the Ohio Department of Natural Resources announced that companies seeking horizontal well drilling permits within 3 miles of known fault lines or locations of past seismic activity will have to install seismic monitors. If an event larger than a magnitude of 1.0 occurs, the well would have to halt operations so scientists can try to determine the cause of the event. If they determine that the depth of the event was in the bedrock beneath the well and as such likely wasn't caused by the injection, operations can resume. But if the event originated near the well bore, the well will be shut down.
- Oklahoma: The construction and use of injection wells requires certain permits administered by the Oklahoma Corporation Commission (OCC). In March of this year, the OCC [unanimously](#) voted to require that oil and gas companies adhere to new standards for monitoring and reporting data from disposal wells in central Oklahoma's earthquake-prone Arbuckle Formation in order to be granted those permits. The rules mandate data collection such as daily (as opposed to the previous requirement of monthly) injection pressure and volume measurements. These numbers should help federal and university seismologists who were concerned about not having sufficient data to study the wells' effect on Oklahoma's recent earthquake swarm.

 [fracking](#)

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